Association for Information Systems
AIS Electronic Library (AISeL)

SAIS 2018 Proceedings | Southern (SAIS)

Spring 3-2018

# INFORMATION SYSTEMS STRATEGIC LEADERSHIP IN THE LAST DECADE: NEW ADVANCEMENTS AND BLUE OCEAN OPPORTUNITIES

Mazen Shawosh
*University of Georgia*, m.shawosh@uga.edu

# INFORMATION SYSTEMS STRATEGIC LEADERSHIP IN THE LAST DECADE: NEW ADVANCEMENTS AND BLUE OCEAN OPPORTUNITIES

**Mazen Shawosh**
University of Georgia
m.shawosh@uga.edu

## ABSTRACT

Information Systems (IS) strategic leadership literature is an important research stream in the IS field. Chief Information Officers (CIO) are central to this literature, with several themes discussing the roles, characteristics, effectiveness, CIO/TMT relationships, and organizational impact of CIOs. This paper discusses the IS leadership literature in last decade (2007-2017) with the objectives of synthesizing the recent articles, identifying new emerging themes, and presenting opportunities for "Blue Ocean" research. We argue that more research is still needed in this field, and potential contributions for both academia and practice are great.

### Keywords

Chief information officer, CIO, IS strategic leadership, Performance, Top management team (TMT).

## INTRODUCTION

With organizations shifting to the digital business era, the complexity of the technologies and responsibilities that Chief Information Officers (CIOs) orchestrate is increasing every year. According to the 2017 State of the CIO report, CIOs increasingly see themselves as playing more transformational and strategic roles than before (Muse 2017). In addition, IT budgets and investments are also increasing (Muse 2017), putting more pressure on CIOs to translate these huge sums of money into organizational outcomes. Moreover, the IS literature shows that the CIO's role and importance has evolved over time, from the support of business functions and day-to-day operations to more strategic and transformational roles that influence the future and viability of organizations (Banker et al. 2011; Chen et al. 2010; Chun and Mooney 2009).

The last comprehensive review of the IS strategic leadership literature, by Karahanna and Watson (2006), emphasized that this research stream has produced little empirical research with a limited theoretical understanding of the different aspects and topics in IS strategic leadership. They concluded by suggesting that "there is a need for studies to elaborate upon and enhance our understanding of specific constructs, relationships, processes, structures, and mechanisms that underlie such IS Leadership concerns." (p. 173). The purpose of this paper is to comprehensively review the papers in the literature published in the period from 2007-2017, present the new theoretical advancements and contributions, and, finally, suggest new "Blue Ocean" opportunities for search. We searched for and synthesized papers published in the Senior Scholars' Basket of Journals (a basket of eight journals), Information and Management, and MIS Quarterly Executive.

The paper proceeds as follows. First, we briefly present the IS strategic leadership literature before 2007. Next, we summarize and synthesize the literature between 2007 and 2017. We organize the papers into dominant themes and new topics. Then, we present "Blue Ocean" research areas and questions with the potential for both scholarly and practical contributions.

## IS STRATEGIC LEADERSHIP BEFORE 2007

The focus of this literature is on Information Systems leadership at organizations' executive levels. Specifically, the attention is directed toward studying CIOs and their contribution to strategic decision making in organizations. The chief information officer is the highest Information Systems executive in a firm and is responsible for making the strategic decisions related to the firm's information systems (Karahanna and Preston 2013). Since the emergence of the position in the 1980s, the topic of the CIO has gained the attention of information systems researchers from different angles. Researchers have shed light on topics such as CIO roles and role change (Applegate and Elam 1992; Grover et al. 1993), CIO characteristics, skills, and influence (Enns et al. 2003; Gupta 1991; Stephens et al. 1992), CIO relationship with the CEO and the Top Management Team (TMT) (Armstrong and Sambamurthy 1999; Feeny et al. 1992; Johnson and Lederer 2005), and CIO structural power and its consequences (Chatterjee et al. 2001; Raghunathan and Raghunathan 1989; Watson 1990). These articles and others show how valuable CIOs are to their organizations and how CIO presence as part of the TMT has positive effects such as IT assimilation to business strategies and activities, IT strategic alignment, and even improved firm performance. In general, the IS strategic

leadership literature positively views the organizational strategic value of the CIO, and the appointment of a CIO to the TMT is seen as crucial for better performance and contribution of CIOs to their organizations.

These positive results originate from the standpoint that the closer the CIO is to the CEO and the TMT in the firm hierarchy, the greater the chances the CIO has for interaction and official engagement with TMT members to effectively address challenges and opportunities related to IT (Preston et al. 2006; Smaltz et al. 2006). CIOs who are formal members in the TMT and develop trusting relationships with TMT members have the chance to develop better capabilities (e.g., IS and business knowledge) and to be regarded as more effective CIOs (Smaltz et al. 2006). In addition, formal CIO membership in the TMT is one of the formal mechanisms of knowledge exchange that are important to develop shared understanding between the CIO and members of the TMT (Preston and Karahanna 2004; Preston et al. 2006).

## IS STRATEGIC LEADERSHIP IN 2007-2017

We searched the Senior Scholars' Basket of Journals (a basket of eight journals), Information and Management, and MIS Quarterly Executive for articles that explicitly study CIO. The search resulted in 33 articles, which were grouped into the dominant themes used in (Karahanna and Watson 2006). Not all articles are empirical in nature. Some articles, such as those in MIS Quarterly Executive, are descriptive, and some report anecdotal evidence. Nevertheless, we see empirical studies that advance our understanding of CIO and IS leadership in relation to IS and organizational aspects using different theoretical lenses such as the upper echelon theory, organizational boundary, power and politics, organizational inertia theory, and social capital. Figure (1) presents a framework for the IS strategic leadership research that categorizes the studies and the areas they investigated. The figure will also assist us in identifying promising research opportunities and gaps. In the following subsections, we present a synthesis for the articles under each theme.

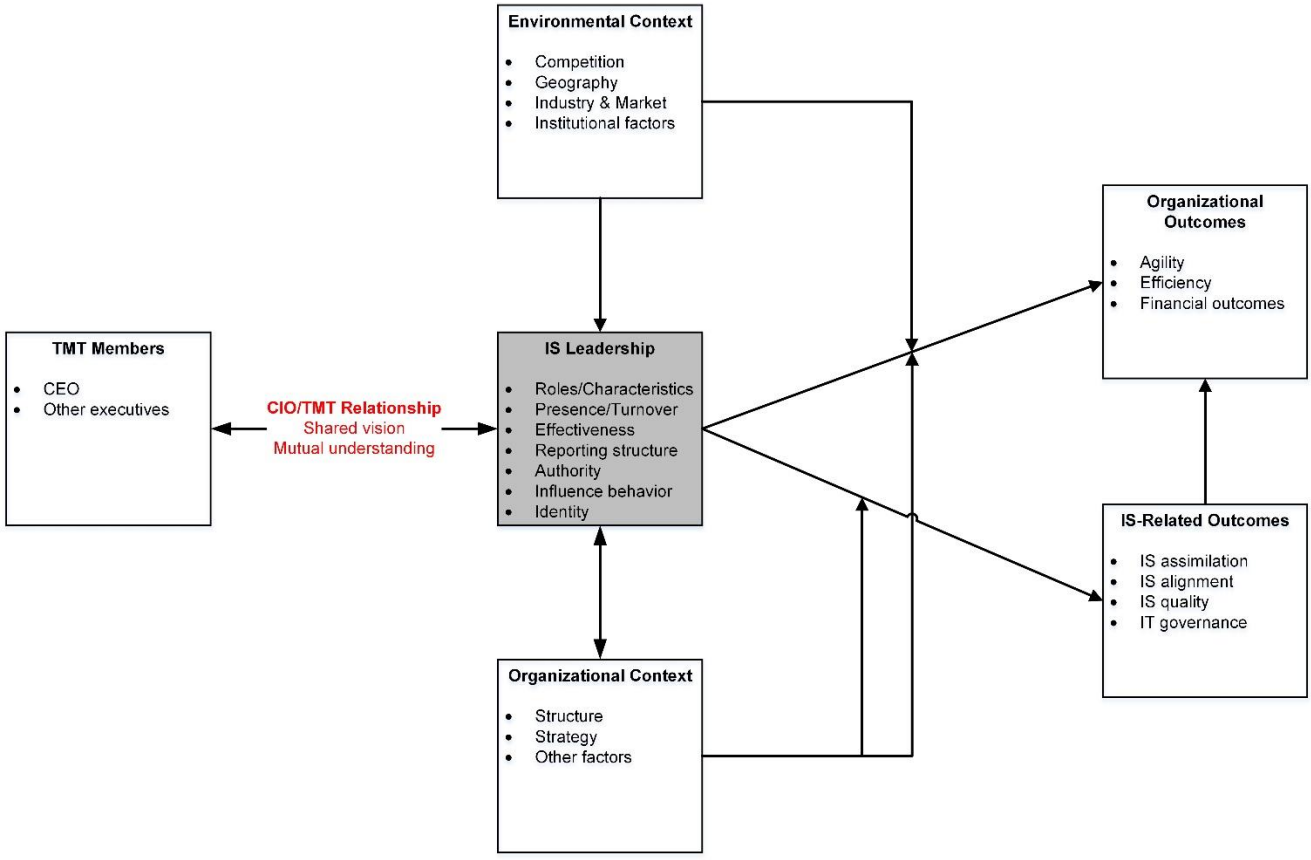


**Figure 1. Framework Depicting Extant Literature and Showing Potential New Opportunities**

### CIO Characteristics

Faced with continuous challenges and diverse tasks, CIOs' success hinges on their ability to leverage their personal characteristics and skills. CIOs should possess skills related to change management, leadership, communications and negotiation, budgeting, and business analysis (Chun and Mooney 2009; Luftman et al. 2015). Possession of technical skills is another important characteristic that is positively linked to investment in IT infrastructure and certain financial measures of organizations (Sobol and Klein 2009). Nevertheless, the lack of prior technical career experience or education does not make the CIO less of a business technology strategist (Carter et al. 2011). In addition, CIOs work in dynamic environments and interact with CEOs and other executives in their organizations. Utilizing different influence behaviors, the CIO influences members of the TMT to support IS-related proposals (Enns et al. 2007). This relationship is important because, although we see many CIOs as part of the TMT, CIOs nonetheless often face difficulties in influencing peers to commit to IS-related projects. These difficulties may be due to the distribution of power, in which executives like the CFO have the lion's share, or even due to the TMT viewing the CIO as responsible for a support (not core) function in the firm. Such behaviors might be used to influence peers and the CEO to create a positive view of IS, allocate more resources, and commit to IS strategic initiatives.

### Role of the CIO

The IS strategic leadership literature has dedicated significant attention to the themes of CIO roles (i.e., obligations, expectations, and duties), roles that CIO play, the factors that influence those roles, and their evolution. CIOs work in dynamic environments and under different contingencies. There is no one role to which all CIOs can ascribe. Studies show several roles CIOs can play, and each role has its challenges, scope, and success factors. CIOs can act as managers who are responsible for "keeping the lights on" by maintaining the current IT infrastructure and fixing related problems. Other CIOs can play wider and more strategic roles by building relationships with executives, empowering the business with IS capabilities, and even leading the digital transformation in organizations (Chun and Mooney 2009; Peppard et al. 2011; Weill and Woerner 2013). Utilizing the view of exploration/exploitation (March 1991), Chen et al. (2010) examined two leadership roles that CIOs play. The first is the supply-side leadership role, where the CIO exploits available IT assets and resources to support ongoing business needs. This role focuses on ensuring cost-effectiveness of service delivery and contributes to the organization's efficiency. The second role is that of demand-side leadership. In this role, the CIO leads IT to contribute to IS quality and the organization's strategic growth by exploring IT innovations, tapping into new strategic opportunities, and deriving strategic value from IS (Chen et al. 2010; Ding et al. 2014). This role is strategic in nature and is emerging as a critical role due to the ubiquity of IT and its assimilation into business activities.

CIO roles evolve and change over time. Such changes might be due to factors such as the appearance of other executives (e.g., COO and CTO) who assume some of the CIO's responsibilities, new regulations and laws (e.g., the Sarbanes-Oxley Act and HIPPA), and organizational and IS-related directions, such as IS criticality for the organization's competitiveness, agility, and effectiveness (Chun and Mooney 2009; Kohli and Johnson 2011; Peppard et al. 2011).

### CIO Role Effectiveness

With CIOs playing several roles in their organizations, what makes them effective executives is another area of interest in the IS strategic leadership literature. By CIO role effectiveness, we refer to the definition by Smaltz et al. (2006): "the assessed performance of the CIO in the context of specific roles, behaviors, and responsibilities that are regarded as salient in firms." (p. 208).

The early empirical investigation by Smaltz et al. (2006) examined what comprises the multidimensional construct of effectiveness and what social interactions and individual capabilities' antecedents influence this effectiveness. Moreover, Preston et al. (2008) looked at CIO expert power (i.e., CIO strategic effectiveness) and how it is associated with CIO decision-making authority. In addition to these two early studies, Chen and Wu (2011) added the construct of CIO IT management effectiveness as another antecedent to CIO role effectiveness. IT management effectiveness is concerned with CIOs having both IT and management competencies that enable them to apply technologies, processes, and organizational structures and strategies.

### IS Strategic Alignment

Within this theme, several empirical studies examined how different aspects of CIO/TMT relationship influence the alignment of IS strategies with business strategies and, subsequently, other important outcomes, such as agility and organizational performance. The argument for the importance of such relationships is that although IT assets, capabilities, and investments are important for IT contributions to firm performance, alone, they are insufficient to reap benefits. Good working relationships between the CIO and the TMT are important complementary forces that combine with IT assets to derive strategic value from IS (Karahanna and Preston 2013). Theories and views utilized include organizational boundary, social capital, IT governance,

and the upper echelon theory. IT strategic alignment is divided into social and intellectual alignments. The social alignment represents a state of mutual understanding between business and IT executives about current and future roles of IT (Liang et al. 2017; D. S. Preston and Karahanna 2009).

Mutual understanding mediates the relationship between the different aspects of the CIO/TMT relationship and the intellectual IT alignment, which is the alignment of strategies, infrastructure, plans, and processes. Cognitive, relational, and structural aspects of the CIO/TMT relationship lead to the creation of mutual understanding. The cognitive aspect pertains to the shared language (i.e., common language and terminology in communication) and shared cognition (i.e., shared understanding about the role of IS within the organization) that facilitate interaction between team members and assimilation of new knowledge. The relational aspect is related to building trust between the CIO and the TMT that enables knowledge exchange and integration. The structural aspect of the relationship regards the CIO's formal membership in the TMT, as well as informal interaction with other executives that provides the CIO the opportunity to communicate and engage with the TMT and to create network ties (Karahanna and Preston 2013; D. S. Preston and Karahanna 2009). Other studies included CIO/CEO reporting structure (Valorinta 2011; Wu et al. 2015) and development of a shared vision of IS (Preston and Karahanna 2009) as factors influencing IS strategic alignment.

The establishment of CIO/TMT mutual understanding indirectly contributes to organizational agility and financial performance. By creating shared understanding between the CIO and the TMT, organizations can promptly respond to changes in the business environment by reducing the potential rigidities created in the process of aligning IT and business strategies, leading to more agile organizations (Liang et al. 2017). Moreover, mutual understanding leads to improved organizational financial performance through IS strategic alignment (Karahanna and Preston 2013).

### CIO Organizational Impact

The development of mutual understanding is one mechanism through which CIOs create IT-enabled business value. The CIO/CEO reporting arrangement has important implications for organizations. Hierarchical proximity of the CIO to the CEO and their reporting arrangement have been shown to influence firm performance in various ways. The rationale behind the positive impact of CIO on firm performance is that the direct reporting to the CEO "enables the CIO to obtain a global and holistic perspective on the organization, its goals and strategies, and enhances the CIO's understanding of the TMT's vision of the organization" (Wu et al. 2015, p. 504). The reporting structure of the CIO position is also linked to the level of the CIO's strategic decision-making authority. To become effective strategic leaders, CIOs should have the authority to engage in strategic decision making. CIO strategic decision-making authority has been linked to positive IT contribution to organizational performance (Preston, Chen, et al. 2008; Preston, Leidner, et al. 2008). Another study, however, found no relationship between CIO reporting structure and IT governance in US hospitals (Bradley et al. 2012). Not all organizations have CIOs reporting directly to CEOs. Firms that follow a differentiation strategy tend to have CIOs report directly to CEOs, and firms that follow a cost leadership strategy tend to have CIO/CFO reporting relationships (Banker et al. 2011). The argument is that the reporting structure should be thought of "as a mean to create business value by allowing the CIO to work under the most appropriate C-level executive" (Banker et al. 2011, p. 488).

### New Topics

New areas of interest in IS strategic leadership have appeared in the last decade. This emergence is a positive sign, as the IS strategic leadership literature requires more research, and areas of potential contribution remain untapped. IT executives can help their organizations achieve external legitimacy (i.e., public recognition) by projecting to external stakeholders an image of IT capability superiority (Lim et al. 2013). With this move, IT executives hope that their organizations will increase the internal legitimacy (e.g., promote IT executives) of the IT unit. The greater the IT executives' expert and structural powers, the greater the likelihood of archiving external legitimacy. The topic of incoming (i.e., new) CIO appointment has recently drawn scholarly attention. New CIOs inherit IT organizations that are new and need to be built up, are troubled or drifting towards trouble, or are successful (Gerth and Peppard 2014). They also succeed predecessor CIOs who leave legacies that might place burdens on those incoming CIOs (Leidner and Mackay 2007). Thus, challenges new CIOs might encounter include facing skepticism about IT value, confronting pessimistic stakeholders, restoring confidence in the CIO role and IT, and reestablishing the credibility of the IT organization (Leidner and Mackay 2007). These challenges result in different approaches that CIOs follow when taking charge. New CIOs can take charge incrementally by focusing on a few activities, such as assessing the current status of IT governance and infrastructure, and understanding business strategies and needs. On the other hand, new CIOs can approach their jobs by performing radical changes that focus on tackling several critical issues and demonstrating quick change to stakeholders (Gerth and Peppard 2014; Leidner and Mackay 2007). In addition to the focus on CIOs, Chief Digital Officers (CDOs) are also gaining attention in the literature. The research on CDOs resembles the early research on CIO in that researchers are attempting to understand the role and its responsibilities, CDO characteristics, and its relationship to other executives, especially the CIO. The CDO's role involves orchestrating the organization's digital transformation, building

digital capabilities, and exploring and implementing emerging digital advancements (Singh and Hess 2017; Tumbas et al. 2017). Organizations might appoint a new CDO position because the CIO and IT unit are pre-occupied with their own projects and responsibilities (e.g., maintaining enterprise-wide technologies, security, and IT infrastructure), making the need for a new role important to guiding and executing current and emerging digital initiatives. In addition, units in organizations such as marketing and HR are embracing digital innovations and are engaging with and executing their own digital initiatives (Tumbas et al. 2017).

## BLUE OCEAN OPPORTUNITIES

Over the last three decades, the IS strategic leadership literature has advanced our understanding in several areas. Nevertheless, many interesting questions have yet to be answered regarding the CIO and newly emerging IT-related titles. In this section, we present examples of some promising areas of investigation and compile a list (Table 1) of future research questions[1].

### New CIO Effectiveness

Limited research has been conducted to empirically examine the antecedents and consequences of CIO role effectiveness. This is a promising area for scholarly contribution to the field. We believe that CIO effectiveness still requires more investigation to understand the mechanisms through which this central construct impacts and is impacted, as well as under what conditions the antecedents (e.g., individual and social) influence CIO effectiveness. For example, can we say that newly appointed CIOs are assessed by peers in the same way as old CIOs in their positions? If we can argue that there is a difference, then what are these factors that influence new CIO effectiveness?

### CIO Identity Adaptation

Transition from role to role is inevitable in organizations. Research on the CIO role in firms has made clear that role responsibilities and importance have increased over the years as technology has become central to firms' operations, strategies and transformations. With this increasing status, CIOs have established their professional identities. Over the years, CIOs have been required not only to possess technical competencies but also to acquire new skills and knowledge about their business, enhance communication and working relations with the CEO and the TMT, and augment their knowledge about their organization's industry and environment. The research in IS leadership literature and practice suggests that CIO identity has a clear form and substance. Nevertheless, new digital innovations are disrupting firms and the way they conduct business. We believe that the digital transformation demands a new set of skills, knowledge, and attitudes with which some CIOs are not familiar. Such new aspects might "produce fundamental changes in the individual's self-definitions" (Ibarra 1999). As defined, identity is the various meanings attached to the role not only by the self (e.g., CIO) but also by others (e.g., TMT, staff). Hence, a study that seeks to examine CIO professional identity adaptation should take the perspective of others in the organization. Some potential research questions include: How do digital transformations impact CIO professional identity? What is the outcome of this adaptation process: CIO to CDO? CIO to a technical and not strategic role? How does CIO adaptation influence CIO performance?

### CIO Appointment under Red Queen Competition

In environments characterized by Red Queen competition, actions by organizations are visible to their rivals. The focal organization's actions are "externally directed, specific and observable competitive moves initiated by a firm to enhance its relative competitive position" and rival organizations' actions are "externally directed competitive moves of all rivals in the industry in which the focal firm's participation is studied" (Derfus et al. 2008, p. 62). Appointing/firing CIOs from the TMT is a structural decision action based on strategic, structural, and environmental factors (Menz 2012). This action is visible to both rivals and stakeholders, and the market reacts to such decisions (e.g., new CIO position announcements and their relationship to abnormal stock market returns (Chatterjee et al. 2001). This action can also signal several important things about the focal organization, such as improving IS management capabilities and increasing the role and importance of IS. How the appointment of CIOs impacts organizational performance can be viewed from both the resource-based view (Barney 1991) and the upper echelon theory (Hambrick and Mason 1984). From this brief discussion, an interesting potential research question arises: How does the appointment of a CIO when the organization should not be appointing, or the failure to appoint a CIO when the organization should be appointing, influence organizational performance compared with a cohort of rivals?

[1] The figure and some of the research questions in the table are adapted from (Menz 2012), which reviews functional TMT member research.

### CIO/CDO & Competency Traps

The digital age brings with it numerous challenges that threaten organizational stability, and, at the same time, creates countless opportunities on which organizations may capitalize. New knowledge, technologies, new consumer demands, and even new competitors are some of the digital dimensions of which organizations should be aware. Put succinctly, "As strategic and operating conditions become increasingly turbulent due to factors such as hyper-competition, increasing demands from customers, regulatory changes, and technological advancements, the ability to sense relevant change and respond readily becomes an important determinant of firm success" (Overby et al. 2006, p. 120). Organizations are more inclined towards exploiting and improving their current technological competencies and knowledge. This will hamper the capability of organizations to sense digital opportunities and acquire new digital competencies and knowledge. In the long term, as dynamics shift toward digitization, excessive dependence on exploiting current IT competencies would be destructive. The organizations that fail to respond strategically to digital change are said to be trapped in their inferior competencies (Levitt and March 1988). Competency traps can harm the competitive position of organizations as their strengths turn into weaknesses, preventing them from gaining and developing new competencies (Carolis 2003). From this discussion, it becomes important to ask how CIOs and CDOs can work together in acquiring and assimilating the necessary digital capabilities to break from organizational competency traps.

| Area | Research questions |
|---|---|
| **CDO & nature of work** | Who is the CDO? What does he/she do?<br>What are the features of the CDO role?<br>What are the similarities & differences between CDOs across settings? |
| **CIO & TMT members & TMT processes** | Does the fit of CIO demographic characteristics with the CEO and/or TMT members enhance CIO effectiveness?<br>How does the CIO effectively interact, reach consensus, and engage in decision making with the CIO and TMT?<br>How does the CIO's presence affect TMT behavioral integration? |
| **CIO ties beyond TMT** | How does the CIO collaborate with the board of directors?<br>To what extent does the interaction of the CIO with middle managers benefit the implementation of IT-specific plans and strategies?<br>Do boundary-spanning networks of CIOs affect firm outcomes? To what extent? |
| **CIO & change** | How does CIO presence, turnover, and composition change over time?<br>What general and specific factors affect the decision to have a CIO in the TMT?<br>Does organization design affect the decision to have a CIO in the TMT and/or the CIO role?<br>To what extent do institutional or bandwagon effects influence the CIO-related factors (e.g., presence, role nature)? |
| **CIO & TMT impact** | How does the CIO affect strategic decision making?<br>How does the CIO affect the firm's strategy?<br>To what extent is the CIO ambidextrous?<br>Does the CIO benefit the firm more than other TMT members do?<br>How do multiple contingencies (and their interaction) affect the benefits of CIO presence? |

**Table 1. Future Potential Research Questions**

## CONCLUSION

In this article, our goal was to present a synthesis of the IS strategic leadership literature in the last decade (2007-2017) and offer suggestions for potential future research opportunities that remain unexplored and would result in both scholarly and practical contributions. The recent literature has advanced our understanding with rigorous empirical research on the topics such as CIO effectiveness, CIO/TMT relationships, and CIO roles. Nevertheless, we need more empirical research that investigates new blue ocean areas.

## REFERENCES

Applegate, L. M., and Elam, J. J. 1992. "New Information Systems Leaders: A Changing Role in a Changing World," *MIS Quarterly* (16:4), pp. 469–490. (https://doi.org/10.2307/249732).

Armstrong, C. P., and Sambamurthy, V. 1999. "Information Technology Assimilation in Firms: The Influence of Senior Leadership and IT Infrastructures," *Information Systems Research* (10:4), pp. 304–327. (https://doi.org/10.1287/isre.10.4.304).

Banker, R. D., Hu, N., Pavlou, P. A., and Luftman, J. 2011. "CIO Reporting Structure, Strategic Positioning, and Firm Performance," *MIS Q.* (35:2), pp. 487–504.

Barney, J. 1991. "Firm Resources and Sustained Competitive Advantage," *Journal of Management* (17:1), pp. 99–120. (https://doi.org/10.1177/014920639101700108).

Bradley, R. V., Byrd, T. A., Pridmore, J. L., Thrasher, E., Pratt, R. M., and Mbarika, V. W. 2012. "An Empirical Examination of Antecedents and Consequences of IT Governance in US Hospitals," *Journal of Information Technology* (27:2), pp. 156–177. (https://doi.org/10.1057/jit.2012.3).

Carolis, D. M. D. 2003. "Competencies and Imitability in the Pharmaceutical Industry: An Analysis of Their Relationship with Firm Performance," *Journal of Management* (29:1), pp. 27–50. (https://doi.org/10.1177/014920630302900103).

Carter, M., Grover, V., and Thatcher, J. B. 2011. "The Emerging CIO Role of Business Technology Strategist," *MIS Quarterly Executive* (10:1), pp. 19–29.

Chatterjee, D., Richardson, V. J., and Zmud, R. W. 2001. "Examining the Shareholder Wealth Effects of Announcements of Newly Created CIO Positions," *MIS Quarterly* (25:1), pp. 43–70. (https://doi.org/10.2307/3250958).

Chen, D. Q., Preston, D. S., and Xia, W. 2010. "Antecedents and Effects of CIO Supply-Side and Demand-Side Leadership: A Staged Maturity Model," *Journal of Management Information Systems* (27:1), pp. 231–272. (https://doi.org/10.2753/MIS0742-1222270110).

Chen, Y.-C., and Wu, J.-H. 2011. "IT Management Capability and Its Impact on the Performance of a CIO," *Information & Management* (48:4), pp. 145–156. (https://doi.org/10.1016/j.im.2011.04.001).

Chun, M., and Mooney, J. 2009. "CIO Roles and Responsibilities: Twenty-Five Years of Evolution and Change," *Information & Management* (46:6), pp. 323–334. (https://doi.org/10.1016/j.im.2009.05.005).

Derfus, P. J., Maggitti, P. G., Grimm, C. M., and Smith, K. G. 2008. "The Red Queen Effect: Competitive Actions And Firm Performance," *Academy of Management Journal* (51:1), pp. 61–80. (https://doi.org/10.5465/AMJ.2008.30708624).

Ding, F., Li, D., and George, J. F. 2014. "Investigating the Effects of IS Strategic Leadership on Organizational Benefits from the Perspective of CIO Strategic Roles," *Information & Management* (51:7), pp. 865–879. (https://doi.org/10.1016/j.im.2014.08.004).

Enns, H. G., Huff, S. L., and Higgins, C. A. 2003. "CIO Lateral Influence Behaviors: Gaining Peers' Commitment to Strategic Information Systems," *MIS Quarterly* (27:1), pp. 155–176.

Enns, H. G., McFarlin, D. B., and Huff, S. L. 2007. "How CIOs Can Effectively Use Influence Behaviors," *MIS Quarterly Executive* (6:1), pp. 29–38.

Feeny, D. F., Edwards, B. R., and Simpson, K. M. 1992. "Understanding the CEO/CIO Relationship," *MIS Quarterly* (16:4), pp. 435–448. (https://doi.org/10.2307/249730).

Gerth, A. B., and Peppard, J. 2014. "How Newly Appointed CIOs Take Charge," *MIS Quarterly Executive* (13:3), pp. 159–173.

Grover, V., Jeong, S.-R., Kettinger, W. J., and Lee, C. C. 1993. "The Chief Information Officer: A Study of Managerial Roles," *Journal of Management Information Systems* (10:2), pp. 107–130. (https://doi.org/10.1080/07421222.1993.11518002).

Gupta, Y. P. 1991. "The Chief Executive Officer and the Chief Information Officer: The Strategic Partnership," *Journal of Information Technology* (6:3–4), pp. 128–139. (https://doi.org/10.1057/jit.1991.28).

Hambrick, D. C., and Mason, P. A. 1984. "Upper Echelons: The Organization as a Reflection of Its Top Managers," *Academy of Management Review* (9:2), pp. 193–206. (https://doi.org/10.5465/AMR.1984.4277628).

Ibarra, H. 1999. "Provisional Selves: Experimenting with Image and Identity in Professional Adaptation," *Administrative Science Quarterly* (44:4), pp. 764–791. (https://doi.org/10.2307/2667055).

Johnson, A. M., and Lederer, A. L. 2005. "The Effect of Communication Frequency and Channel Richness on the Convergence Between Chief Executive and Chief Information Officers," *Journal of Management Information Systems* (22:2), pp. 227–252. (https://doi.org/10.1080/07421222.2005.11045842).

Karahanna, E., and Preston, D. S. 2013. "The Effect of Social Capital of the Relationship Between the CIO and Top Management Team on Firm Performance," *Journal of Management Information Systems* (30:1), pp. 15–56. (https://doi.org/10.2753/MIS0742-1222300101).

Karahanna, E., and Watson, R. T. 2006. "Information Systems Leadership," *IEEE Transactions on Engineering Management* (53:2), pp. 171–176.

Kohli, R., and Johnson, S. 2011. "Digital Transformation in Latecomer Industries: CIO and CEO Leadership Lessons from Encana Oil & Gas (USA) Inc," *MIS Quarterly Executive* (10:4), pp. 141–156.

Leidner, D. E., and Mackay, J. M. 2007. "How Incoming CIOs Transition into Their New Jobs," *MIS Quarterly Executive* (6:1), pp. 17–28.

Levitt, B., and March, J. G. 1988. "Organizational Learning," *Annual Review of Sociology* (14), pp. 319–340.

Liang, H., Wang, N., Xue, Y., and Ge, S. 2017. "Unraveling the Alignment Paradox: How Does Business—IT Alignment Shape Organizational Agility?," *Information Systems Research* (28:4), pp. 863–879. (https://doi.org/10.1287/isre.2017.0711).

Lim, J.-H., Stratopoulos, T. C., and Wirjanto, T. S. 2013. "Sustainability of a Firm's Reputation for Information Technology Capability: The Role of Senior IT Executives," *Journal of Management Information Systems* (30:1), pp. 57–96. (https://doi.org/10.2753/MIS0742-1222300102).

Luftman, J., Derksen, B., Dwivedi, R., Santana, M., Zadeh, H. S., and Rigoni, E. 2015. "Influential IT Management Trends: An International Study," *Journal of Information Technology* (30:3), pp. 293–305. (https://doi.org/10.1057/jit.2015.18).

March, J. G. 1991. "Exploration and Exploitation in Organizational Learning," *Organization Science* (2:1), pp. 71–87. (https://doi.org/10.1287/orsc.2.1.71).

Menz, M. 2012. "Functional Top Management Team Members A Review, Synthesis, and Research Agenda," *Journal of Management* (38:1), pp. 45–80. (https://doi.org/10.1177/0149206311421830).

Muse, D. 2017. "State of the CIO 2017: More Challenging, Still Complicated," *CIO*, , February 20. (http://www.cio.com/article/3163000/cio-role/state-of-the-cio-2017-more-challenging-still-complicated.html, accessed July 12, 2017).

Overby, E., Bharadwaj, A., and Sambamurthy, V. 2006. "Enterprise Agility and the Enabling Role of Information Technology," *European Journal of Information Systems* (15:2), pp. 120–131. (https://doi.org/10.1057/palgrave.ejis.3000600).

Peppard, J., Edwards, C., and Lambert, R. 2011. "Clarifying the Ambiguous Role of the Cio," *MIS Quarterly Executive* (10:1), pp. 31–44.

Preston, D., and Karahanna, E. 2004. "Mechanisms for the Development of Shared Mental Models between the CIO and the Top Management Team," *ICIS 2004 Proceedings*. (https://aisel.aisnet.org/icis2004/37).

Preston, D., and Karahanna, E. 2009. "How to Develop a Shared Vision: The Key to Is Strategic Alignment," *MIS Quarterly Executive* (8:1), pp. 1–8.

Preston, D. S., Chen, D., and Leidner, D. E. 2008. "Examining the Antecedents and Consequences of CIO Strategic Decision-Making Authority: An Empirical Study*," *Decision Sciences* (39:4), pp. 605–642. (https://doi.org/10.1111/j.1540-5915.2008.00206.x).

Preston, D. S., and Karahanna, E. 2009. "Antecedents of IS Strategic Alignment: A Nomological Network," *Information Systems Research* (20:2), pp. 159–179. (https://doi.org/10.1287/isre.1070.0159).

Preston, D. S., Karahanna, E., and Rowe, F. 2006. "Development of Shared Understanding between the Chief Information Officer and Top Management Team in U.S. and French Organizations: A Cross-Cultural Comparison," *IEEE Transactions on Engineering Management* (53:2), pp. 191–206. (https://doi.org/10.1109/TEM.2006.872244).

Preston, D. S., Leidner, D. E., and Chen, D. 2008. "CIO Leadership Profiles: Implications of Matching Cio Authority and Leadership Capability on It Impact," *MIS Quarterly Executive* (7:2), pp. 57–69.

Raghunathan, B., and Raghunathan, T. S. 1989. "Relationship of the Rank of Information Systems Executive to the Organizational Role and Planning Dimensions of Information Systems," *Journal of Management Information Systems* (6:1), pp. 111–126. (https://doi.org/10.1080/07421222.1989.11517852).

Singh, A., and Hess, T. 2017. "How Chief Digital Officers Promote the Digital Transformation of Their Companies," *MIS Quarterly Executive* (16:1), pp. 1–17.

Smaltz, D. H., Sambamurthy, V., and Agarwal, R. 2006. "The Antecedents of CIO Role Effectiveness in Organizations:An Empirical Study in the Healthcare Sector," *IEEE Transactions on Engineering Management* (53:2), pp. 207–222. (https://doi.org/10.1109/TEM.2006.872248).

Sobol, M. G., and Klein, G. 2009. "Relation of CIO Background, IT Infrastructure, and Economic Performance," *Information & Management* (46:5), pp. 271–278. (https://doi.org/10.1016/j.im.2009.05.001).

Stephens, C. S., Ledbetter, W. N., Mitra, A., and Ford, F. N. 1992. "Executive or Functional Manager? The Nature of the CIO's Job," *MIS Quarterly* (16:4), pp. 449–467. (https://doi.org/10.2307/249731).

Tumbas, S., Berente, N., and vom Brocke, J. 2017. "Three Types of Chief Digital Officers and the Reasons Organizations Adopt the Role," *MIS Quarterly Executive* (16:2), pp. 121–134.

Valorinta, M. 2011. "IT Alignment and the Boundaries of the IT Function," *Journal of Information Technology* (26:1), pp. 46–59. (https://doi.org/10.1057/jit.2010.28).

Watson, R. T. 1990. "Influences on the IS Manager's Perceptions of Key Issues: Information Scanning and the Relationship with the CEO," *MIS Quarterly* (14:2), pp. 217–231. (https://doi.org/10.2307/248780).

Weill, P., and Woerner, S. L. 2013. "The Future of the CIO in a Digital Economy," *MIS Quarterly Executive* (12:2), pp. 65–75.

Wu, S. P.-J., Straub, D. W., and Liang, T.-P. 2015. "How Information Technology Governance Mechanisms and Strategic Alignment Influence Organizational Performance: Insights from a Matched Survey of Business and It Managers," *MIS Quarterly* (39:2), pp. 497–518.